Chapter : 15. PROBABILITY

Exercise : 15A

Question: 1

Total number times coin tossed: 500

Number of times head occurred: 285

Number of times tail occurred: 215

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

(i). Let p(H) be probability of head

P (H) = $\frac{\text{Number of times head occurred}}{\text{Total number of times coin tossed}}$

P (H) = $\frac{285}{500}$ = 0.57

(ii). Let p(T) be probability of tale

P (T) = $\frac{\text{Number of times tale occurred}}{\text{Total number of times coin tossed}}$

P (T) = $\frac{215}{500}$ = 0.43

Question: 2

Total number times coin tossed: 400

Number of times Two heads occurred: 112

Number of times One head occurred: 160

Number of times No head (zero head) occurred: 128

Probability P()= $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

(i). Let p(H_1) be probability of getting Two heads

P (H_1) = $\frac{\text{Number of times Two heads occurred}}{\text{Total number of times coins tossed}}$

P (H_1) = $\frac{112}{400}$ = 0.28

(ii). Let p(H_2) be probability of getting One head

P (H_2) = $\frac{\text{Number of times One head occurred}}{\text{Total number of times coins tossed}}$

P (H_2) = $\frac{160}{400}$ = 0.4

(iii). Let p(H_3) be probability of getting No head

P (H_3) = $\frac{\text{Number of times No head occurred}}{\text{Total number of times coins tossed}}$

P (H_3) = $\frac{128}{400}$ = 0.32

Question: 3

Total number times coins tossed: 200

Number of times Three heads occurred: 39

Number of times Two head occurred: 58

Number of times One heads occurred: 67

Number of times No(Zero) head occurred: 36

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

(i). Let P(H_1) be probability of getting Three heads

P (H_1) = $\frac{\text{Number of times Three heads occurred}}{\text{Total number of times coins tossed}}$

P (H_1) = $\frac{39}{200}$ = 0.195

(ii). Let P(H_2) be probability of getting One head

P (H_2) = $\frac{\text{Number of times One head occurred}}{\text{Total number of times coins tossed}}$

P(H_2) = $\frac{67}{200}$ = 0.335

(iii). Let P(H_3) be probability of getting No heads (zero heads)

P (H_3) = $\frac{\text{Number of times Zero heads occurred}}{\text{Total number of times coins tossed}}$

P (H_3) = $\frac{36}{200}$ = 0.18

(iv). Let P(H_4) be probability of getting Two heads

P (H_4) = $\frac{\text{Number of times Two heads occurred}}{\text{Total number of times coins tossed}}$

P (H_4) = $\frac{58}{200}$ = 0.29

Question: 4

Total number times a Die Rolled: 300

Number of times 3 occurred on die: 54

Number of times 6 occurred on die: 33

Number of times 5 occurred on die: 39

Number of times 1 occurred in die: 60

Probability = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

(i). Let p(3) be probability of getting 3 on die

P (3) = $\frac{\text{Number of times 3 occurred on die}}{\text{Total number of times a die is rolled}}$

P (3) = $\frac{54}{300}$ = 0.18

(ii). Let p(6) be probability of getting 6 on die

P (6) = $\frac{\text{Number of times 6 occurred on die}}{\text{Total number of times a die is rolled}}$

P (6) = $\frac{33}{300}$ = 0.11

(iii). Let p(5) be probability of getting 5 on die

P (5) = $\frac{\text{Number of times 5 occurred on die}}{\text{Total number of times a die is rolled}}$

P (5) = $\frac{39}{300}$ = 0.13

(iv). Let p(1) be probability of getting 1 on die

P (1) = $\frac{\text{Number of times 1 occurred on die}}{\text{Total number of times a die is rolled}}$

P (1) = $\frac{60}{300}$ = 0.2

Question: 5

Total number of ladies: 200

Number of ladies who like coffee: 142

Number of ladies who dislike coffee: 58

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

(i). Let p(Coffee) be probability of ladies who like coffee

P (Coffee) = $\frac{\text{Number of ladies who like coffee}}{\text{Total number ladies}}$

P (Coffee) = $\frac{142}{200}$ = 0.71

(ii). Let p(No Coffee) be probability of ladies who dislikes coffee

P (No Coffee) = $\frac{\text{Number of ladies who dislike coffee}}{\text{Total number of ladies}}$

P (No Coffee) = $\frac{58}{200}$ = 0.29

Question: 6

Total number of unit tests: 6

Number of Unit tests in which, the student got more than 60%: 2

That includes 1.) unit test II and

2.) unit test V

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

1.Let P(U) be probability of Student scoring more than 60% in unit tests

P (U) = $\frac{\text{Number of unit tests a student scored more than 60\%}}{\text{Total number of unit tests}}$

P (U) = $\frac{2}{6} = \frac{1}{3}$

Question: 7

Total number of vehicles observed: 240

Number of Two wheeler vehicles: 84

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

1.Let P(Two) be probability of Two wheelers

P (Two) = $\frac{\text{Number of Two wheeler vehicles}}{\text{Total number of vehicals}}$

P (Two) = $\frac{84}{240}$ = 0.35

Question: 8

Total number of Numbers on a page: 200

Number of telephone Numbers which have 5 in its units place: 24

Number of telephone Numbers which have 8 in its units place: 16

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

1.Let P(5) be probability of telephone number having 5 in the units place

$$P(5) = \frac{\text{Number of telephone Numbers having 5 in units place}}{\text{Total number of telephone Numbers}}$$

$$P(5) = \frac{24}{200} = 0.12$$

2.Let P(8) be probability of telephone number having 8 in units place $P(8) = \frac{\text{Number of telephone Numbers having 8 in units place}}{\text{Total number of telephone Numbers}}$

$$P(8) = \frac{16}{200} = 0.08$$

Question: 9

Total number of Students: 40

Number of Students having blood group O: 14

Number of Students having blood group AB: 6

$$\text{Probability } P() = \frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$$

1.Let P(O) be probability of selecting a student with Blood group O

$$P(O) = \frac{\text{Number of Students having blood group O}}{\text{Total number Students}}$$

$$P(O) = \frac{14}{40} = 0.35$$

2.Let P(AB) be probability of selecting a student with Blood group AB

$$P(AB) = \frac{\text{Number of Students having blood group AB}}{\text{Total number Students}}$$

$$P(AB) = \frac{6}{40} = 0.15$$

Question: 10

Total number of Students: 30

Number of Students having marks in the range 21-30: 6

$$\text{Probability } P() = \frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$$

1.Let P(S) be probability of selecting a student having marks in the range 21-30

$$P(S) = \frac{\text{Number of Students having marks in the range } 21-31}{\text{Total number Students}}$$

$$P(S) = \frac{6}{30} = 0.2$$

Question: 11

Total number of Patients: 360

Number of Patients who are 30 Years or more but less than 40 years: 60

(This include age groups between 30-40)

Number of Patients who are 50 Years or more but less than 70 years: 80

(This include patients of age groups 50-60 and 60-70 therefore 50+30=80)

Number of Patients who are less than 10 years: 0 (No patients below 10 years)

Number of Patients who are 10 years or more: 360 (this include all age -

groups admitted in the hospital)

$$\text{Probability } P() = \frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$$

(i). Let $P(P_1)$ be probability of patients between age groups 30-40

$$P(P_1) = \frac{\text{Number of patients between age group 30–40}}{\text{Total number of patients}}$$

$$P(P_2) = \frac{60}{360} = \frac{1}{6}$$

(ii). Let $P(P_2)$ be probability of patients between age groups 50-70

$$P(P_2) = \frac{\text{Number of patients between age groups 50–70}}{\text{Total numberof patients}}$$

$$P(P_2) = \frac{80}{360} = \frac{2}{9}$$

(iii). Let $P(P_3)$ be probability of patients who are less than 10 years

$$P(P_3) = \frac{\text{Number of patients who are less than 10 years}}{\text{Total numberof patients}}$$

$$P(P_3) = \frac{0}{360} = 0$$

(iv). Let $P(P_4)$ be probability of patients whose age is more than 10 years

$$P(P_4) = \frac{\text{Number of patients with age more than 10 years}}{\text{Total number of patients}}$$

$$P(P_4) = \frac{360}{360} = 1$$

Exercise : CCE QUESTIONS

Question: 1

A coin is tossed

Solution:

Total number times a coin is tossed = 100

Number of times head occurred = 43

Number of times tail occurred = 57

$$\text{Probability P()} = \frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$$

$$\text{Probability of getting a head is P(head)} = \frac{\text{Number of heads occurred}}{\text{Total number of times a coin is tossed}} = \frac{43}{100}$$

Question: 2

A coin is tossed

Solution:

Total number times a coin is tossed = 200

Number of times head occurred = 112

Number of times tail occurred = 88

$$\text{Probability P()} = \frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$$

$$\text{Probability of getting a head is P(head)} = \frac{\text{Number of times head occurred}}{\text{Total number of times coin is tossed}} = \frac{112}{200} = \frac{14}{25}$$

Question: 3

A survey of 200 p

Solution:

Total number of persons: 200

Number of persons who like tea: 148

Number of persons who dislike tea: 52

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

Let p(Tea) be probability of person who like tea

P (Tea) = $\frac{\text{Number of persons who like tea}}{\text{Total number persons}}$

P (Tea) = $\frac{148}{200} = \frac{37}{50}$

Question: 4

In a locality, 10

Solution:

Total number of families: 1000

Number of families having no children: 6

Number of families having 1 child: 184

Number of families having 2 children: 672

Number of families having 3 children: 127

Number of families having 4 or more children: 11

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

Let p(2) be probability of families having 2 children

P (2) = $\frac{\text{Number of families having 2 children}}{\text{Total number families}}$

P (2) = $\frac{672}{1000} = \frac{84}{125}$

Question: 5

The table given b

Solution:

Total number of students: 36

Number of students born in October: 3

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

Let p(Oct.) be probability of students born in October.

P (Oct.) = $\frac{\text{Number of students born in october}}{\text{Total number students}}$

P (Oct.) = $\frac{3}{36} = \frac{1}{12}$

Question: 6

In 50 tosses of a

Solution:

Total number times a coin is tossed = 50

Number of times tail occurred = 32

Number of times tail occurred = 50 – 32 = 18

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

Probability of getting a head is P(head) = $\frac{\text{Number of heads occurred}}{\text{Total number of times a coin is tossed}} = \frac{18}{50} = \frac{9}{25}$

Question: 7

In a cricket matc

Solution:

Total number balls batsman played = 30

Number of batsman hits a boundary = 6

Number of batsman doesn't hit a boundary = 30 – 6 = 24

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

Probability of batsman not hitting a boundary is

P(no boundary) = $\frac{\text{Number of times batsman didn}'\text{t hit boundary}}{\text{Total number of balls batsman played}} = \frac{24}{30} = \frac{4}{5}$

Question: 8

A die is thrown 4

Solution:

Total number of times die is thrown: 40

Number of times 5 noted on the uppermost face: 7

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

Probability of getting 5 on uppermost face die is

P(5) = $\frac{\text{Number of time 5 occured on uppermost face of die}}{\text{Total number of times die is rolled}} = \frac{7}{40}$

Question: 9

In 50 throws of a

Solution:

Total number of times die is thrown: 50

Number of times 2 noted on the uppermost face: 9

Number of times 4 noted on the uppermost face: 7

Number of times 6 noted on the uppermost face: 8

Number of times even number noted on the uppermost face: 9+7+8 = 24

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

Probability of getting even number on uppermost face of die is

P(even) = $\frac{\text{Number of times even number noted on the uppermost face}}{\text{Total number of times die is rolled}} = \frac{24}{50} = \frac{12}{25}$

Question: 10

In 65 thrown of a

Solution:

Total number of times die is thrown: 65

Number of times 2 noted on the uppermost face: 10

Number of times 3 noted on the uppermost face: 12

Number of times 5 noted on the uppermost face: 9

Number of times prime number noted on the uppermost face: 10+12+9 = 31

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

Probability of getting even number on uppermost face of die is

P(prime) = $\frac{\text{Number of times prime number noted on the uppermost face}}{\text{Total number of times die is rolled}} = \frac{31}{65}$

Question: 11

On one page of a

Solution:

Total number of telephone numbers on the page: 160

Number of telephone numbers which have 6 in units place is: 15

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

Probability of getting 6 in unit place of a telephone number.

P(6) = $\frac{\text{Number of time 6 occured units place of a telephone number}}{\text{Total number of telephone numbers on the page}} = \frac{15}{160} = \frac{3}{32}$

Question: 12

Two coins are tos

Solution:

Total number times a coin is tossed = 1000

Number of times no heads occurred = 194

Number of times one head occurred = 540

Number of times two head occurred = 266

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

Probability of getting at most one head is

P(at most one head) = $\frac{\text{Number of times at most one head occurred}}{\text{Total number of times a coin is tossed}} = \frac{194+540}{1000} = \frac{734}{1000} = \frac{367}{500}$

Question: 13

80 bulbs are sele

Solution:

Total number bulbs= 80

Number of bulbs, which have lifetime of 300 hrs = 10

Number of bulbs, which have lifetime of 500 hrs = 15

Number of bulbs, which have lifetime of 700 hrs = 23

Number of bulbs, which have lifetime of 900 hrs = 25

Number of bulbs, which have lifetime of 1100 hrs = 7

Number of bulbs , having lifetime less than 900 hrs = 10 + 15 +23 = 48

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

Probability of selecting a bulb which have a lifetime of 900 hrs

P(900) = $\frac{\text{Number of bulbs having the lifetime of 900 hrs}}{\text{Total number of bulbs}} = \frac{48}{80} = \frac{3}{5}$

Question: 14

In a medical exam

Solution:

Total number students= 40

Number of students with blood group ‘A’ = 11

Number of students with blood group ‘B’ = 15

Number of students with blood group ‘AB’ = 9

Number of students with blood group ‘O’ = 5

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

Probability of selecting a student with blood group ‘B’

P(B) = $\frac{\text{Number of students with blood group 'B'}}{\text{Total number of students}} = \frac{15}{40} = \frac{3}{8}$

Question: 15

In a group of 60

Solution:

Total number of members in a group: 60

Number of members who like coffee in the group: 35

Number of members who dislike coffee in the group: 60 – 35 = 25

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

Let p(No coffee) be probability of a member who dislikes the coffee

P (No coffee) = $\frac{\text{Number of members in the group who dislike coffee}}{\text{Total number members in the group}}$

P (No coffee) = $\frac{25}{60} = \frac{5}{12}$

Question: 16

A die is thrown 5

Solution:

Total number times a die is thrown: 50

We know that a die contains only 6 sides (1,2,3,4,5,6) and there is no 8 on any side of the die

Therefore, probability of getting 8 when a die is thrown is : 0

That is P(8) = 0

Question: 17

It is given that

Solution:

Given: P(winning) = 0.7

We know that if P(favorable) is the probability of favorable outcomes, then

P(unfavorable) , is probability of unfavorable outcomes Is given by

P(unfavorable) = 1 – P(favorable)

Therefore,

P(losing) = 1 – P(winning) = 1 – 0.7 = 0.3

Question: 18

A coin is tossed

Solution:

Total number times a coin is tossed = 60

Number of times tail occurred = 35

Number of times tail occurred = 60 – 35 = 25

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

Probability of getting a head is P(head) = $\frac{\text{Number of heads occurred}}{\text{Total number of times a coin is tossed}} = \frac{25}{60} = \frac{5}{12}$

Question: 19

Each question con

Solution:

Here P(boundary) = $\frac{9}{45} = \frac{1}{5}$

P(no boundary) = $1 - \frac{1}{5} = \frac{4}{5}$

Question: 20

Each question con

Solution:

Here always the probability of a sure event is 1

and

P(E), where E is some event, always ranges between $0 \leq P(E) \leq 1$.

Question: 21

Fill in the blank

Solution:

(i) probability of an impossible event = 0

(ii) probability of a sure event = 1

(iii) Let E be an event. then p(not E) = 1 – P(event)

(iv) p (E) +P (not E) = 1

(V) P (E) lies between 0 and 1

Question: 22

The marks obtaine

Solution:

Total number of students : 90

Number of students who scored less than 20% : 7

Number of students who scored more than 60% : 19

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

(i) Let $P(\leq 20)$ be probability of students who scored less than 20%

$P(\leq 20) = \frac{\text{Number of students who scored less than 20\%}}{\text{Total number of students}} = \frac{7}{90}$

(ii) Let $P(\geq 60)$ be probability of students who scored more than 60%

$P(\geq 60) = \frac{\text{Number of students who scored more than 60\%}}{\text{Total number of students}} = \frac{19}{90}$

Question: 23

Is known that a b

Solution:

Total number of electric bulbs = 800

Number of Non-defective bulbs = 800-36 = 764

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

$\therefore$ Probability a Non- defective bulbs P(bulbs) = $\frac{\text{Number of non−defective balls}}{\text{Total number of electric bubls}} = \frac{764}{800} = \frac{191}{200}$

Question: 24

The table given b

Solution:

Total number of teachers: 75

Number of teachers having age 40 years or more than 40 years old: 45

Number of teachers having age 49 years or less than 40 years old: 65 (5+25+35)

Number of teachers having age 60 years or more than 60 years old: 0

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

(i) Let P(more than 40) be probability of teachers having age 40 years or more than 40 years old

P(more than 40) = $\frac{\text{Number of teachers whose age is more than 40}}{\text{Total number of teachers}} = \frac{45}{75} = \frac{3}{5}$

(ii) Let P(less than 49) of teachers having age 49 years or less than 40 years old

P(less than 49) = $\frac{\text{Number of teachers whose age is less than 49}}{\text{Total number of teachers}} = \frac{65}{75} = \frac{13}{15}$

(iii) Let P(more than 60) be probability 60 years or more then 60 years old

P(more than 60) = $\frac{\text{Number of teachers whose age is more than 60}}{\text{Total number of teachers}} = \frac{0}{75} = 0$

Exercise : FORMATIVE ASSESSMENT (UNIT TEST)

Question: 1

There are 600 ele

Solution:

Total number of electric bulbs = 600

Number of bulbs which are defective: 20

Number of Non-defective bulbs = 600-20 = 580

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

$\therefore$ Probability of getting a Non-defective bulbs P(bulbs) = $\frac{\text{Number of non−defective balls}}{\text{Total number of electric bubls}} = \frac{580}{600} = \frac{29}{30}$

Question: 2

A bag contains 5

Solution:

Total number of balls bag containing is: 5 red + 8 black + 7 white = 20 balls

Number of red balls = 8

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

∴ Probability of getting a black ball P(black) = $\frac{\text{Number of black balls}}{\text{Total number of balls}} = \frac{8}{20} = \frac{2}{5}$

Question: 3

A bag contains 16

Solution:

Total number of cards = 16

Chances of drawing a numbered card which is divisible by 3 = 5 (They are 3,6,9,12,15)

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

∴ Probability of drawing a numbered cards which is divisible by 3

P(card divisible by 3) = $\frac{\text{possible chances of drawing a numbered card which is divisible by 3}}{\text{Total number of cards}} = \frac{5}{16}$

Question: 4

In a cricket matc

Solution:

Total number balls batsman played = 32

Number of batsman hits a boundary = 4

Number of batsman doesn’t hit a boundary = 32 – 4 = 28

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

Probability of batsman not hitting a boundary is

P(no boundary) = $\frac{\text{Number of times batsman didn}'\text{t hit boundary}}{\text{Total number of balls batsman played}} = \frac{28}{32} = \frac{7}{8}$

Question: 5

Define the probab

Solution:

The probability of event E is defined as number of outcomes favorable to E divided by total numbers of equally likely outcomes in the sample space S of the experiment.

That is

P(E) = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

Question: 6

A coin is tossed

Solution:

Total number times a coin is tossed = 60

Number of times head occurred = 28

Number of times tail occurred = 32

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

Probability of getting a head is P(head) = $\frac{\text{Number of heads occurred}}{\text{Total number of times a coin is tossed}} = \frac{28}{60} = \frac{7}{15}$

Question: 7

When a die is thr

Solution:

A die has total of 6 sides.

Therefore,

Total possible outcomes area : 6

They are {1,2,3,4,5,6}

Question: 8

Fill in the blank

Solution:

(i) Probability of a sure event = 1

(ii) probability of an impossible event = 0

(iii) If E be an event, then p (E) +p (not E) = 1

(iv) If E is an event, then 0 <p (E)< 1

Question: 9

A die is thrown 8

Solution:

Total number of outcomes: 80

Number of times 2 occurred : 11

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

Probability of getting a 2 on die is P(2) = $\frac{\text{Number of 2 occurred}}{\text{Total number of times a a die is rolled}} = \frac{11}{80}$

Question: 10

The probability o

Solution:

Given: P(winning) = 0.6

We know that if P(favorable) is the probability of favorable outcomes, then

P(unfavorable), is probability of unfavorable outcomes It given by

P(unfavorable) = 1 – P(favorable)

Therefore,

P(losing) = 1 – P(winning) = 1 – 0.6 = 0.4

Question: 11

A coin is tossed

Solution:

Total number times a coin is tossed = 50

Number of times tail occurred = 28

Number of times tail occurred = 50 – 28 = 22

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

Probability of getting a head is P(head) = $\frac{\text{Number of heads occurred}}{\text{Total number of times a coin is tossed}} = \frac{22}{50} = \frac{11}{25}$

Question: 12

In a one day cric

Solution:

Total number balls batsman played = 48

Number of batsman hits a boundary = 8

Number of batsman doesn't hit a boundary = 48 – 8 = 40

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

Probability of batsman not hitting a boundary is

P(no boundary) = $\frac{\text{Number of times batsman didn't hit boundary}}{\text{Total number of balls batsman played}} = \frac{40}{48} = \frac{5}{6}$

Question: 13

Two coins are tos

Solution:

Total number times a coin is tossed = 80

Number of times two heads occurred = 24

Number of times one head occurred = 36

Number of times no head occurred = 20

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

(i) Probability of getting two heads is

P(Two heads) = $\frac{\text{Number of times two heads occurred}}{\text{Total number of times a coin is tossed}} = \frac{24}{80} = \frac{3}{10}$

(ii) Probability of getting one head is

P(one heads) = $\frac{\text{Number of times one head occurred}}{\text{Total number of times a coin is tossed}} = \frac{36}{80} = \frac{9}{20}$

(iii) Probability of getting no head is

P(no head) = $\frac{\text{Number of times head occurred}}{\text{Total number of times a coin is tossed}} = \frac{20}{80} = \frac{1}{4}$

Question: 14

Marks obtained by

Solution:

Total number of students : 90

Number of students who scored less than 20% : 8

Number of students who scored more than 80% : 9

Number of students who scored more than 60% : 35

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

(i) Let P($\leq$20) be probability of students who scored less than 20%

P($\leq$20) = $\frac{\text{Number of students who scored less than 20\%}}{\text{Total number of students}} = \frac{8}{90} = \frac{4}{45}$

(ii) Let P($\geq$80) be probability of students who scored more than 80%

P($\geq$80) = $\frac{\text{Number of students who scored more than 80\%}}{\text{Total number of students}} = \frac{9}{90} = \frac{1}{10}$

(iii) Let P($\geq$60) be probability of students who scored more than 60%

$P(\geq 60) = \frac{\text{Number of students who scored more then 60\%}}{\text{Total number of students}} = \frac{35}{90} = \frac{7}{18}$

Question: 15

The blood group o

Solution:

(i) O

Total number students= 30

Number of students with blood group 'A' = 9

Number of students with blood group 'B' = 11

Number of students with blood group 'AB' = 4

Number of students with blood group 'O' = 6

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

(i) Probability of selecting a student with blood group 'o'

$P(B) = \frac{\text{Number of students with blood group 'o'}}{\text{Total number of students}} = \frac{6}{30} = \frac{1}{5}$

(ii) Probability of selecting a student with blood group 'A'

$P(B) = \frac{\text{Number of students with blood group 'A'}}{\text{Total number of students}} = \frac{9}{30} = \frac{3}{10}$

(iii) Probability of selecting a student with blood group 'AB'

$P(B) = \frac{\text{Number of students with blood group 'AB'}}{\text{Total number of students}} = \frac{4}{30} = \frac{2}{15}$

Question: 16

In a survey of 10

Solution:

Total number families surveyed = 100

Number of families having no boys = 18

Number of families having one boy = 46

Number of families having two boys = 36

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

(i) Probability of family having one boy

$P(\text{one boy}) = \frac{\text{Number of having one boy}}{\text{Total number of families surveyed}} = \frac{46}{100} = \frac{23}{50}$

(ii) Probability of family having 2 boys

$P(\text{two boy}) = \frac{\text{Number of having two boys}}{\text{Total number of families surveyed}} = \frac{36}{100} = \frac{9}{25}$

(iii) Probability of family having no boy

$P(\text{no boy}) = \frac{\text{Number of having no boy}}{\text{Total number of families surveyed}} = \frac{18}{100} = \frac{9}{50}$

Question: 17

A die is thrown 1

Solution:

Total number of outcomes : 100

(i) Chances of getting a number less than 3 on the die = 2 (They are 1,2)

Its frequency is: 12+18 = 30

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

∴ Probability of getting a number less than 3 on die P(less than 3)

$= \frac{\text{possible chances of getting a number less than 3}}{\text{Total number of outcomes}} = \frac{30}{100} = \frac{3}{10}$

(ii) Chances of getting a even number on the die = 3 (They are 2,4,6)

Frequency : 18+26+16 = 60

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

∴ Probability of getting a composite number on die the P(even number)

$= \frac{\text{possible chances of getting a even number}}{\text{Total number of outcomes}} = \frac{60}{100} = \frac{3}{5}$

(iii) Chances of getting a number greater than 4 on the die = 2 (They are 5,6)

Frequence : 14+16 = 30

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

∴ Probability of getting a number not less than 4 on die P(greater than 4)

$= \frac{\text{possible chances of getting a number greater than 4}}{\text{Total number of outcomes}} = \frac{30}{100} = \frac{3}{10}$

Question: 18

A survey of 600 s

Solution:

Total number of students: 600

Number of students who like coffee: 360

Number of students who dislike coffee: 140

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

(i) Let p(like) be probability of ladies who dislike coffee

P (like) = $\frac{\text{Number of students who like coffee}}{\text{Total number students}}$

P (like) = $\frac{360}{600} = \frac{3}{5}$

(ii) Let p(dislike) be probability of ladies who dislike coffee

P (dislike) = $\frac{\text{Number of students who dislike coffee}}{\text{Total number students}}$

P (dislike) = $\frac{140}{600} = \frac{7}{30}$

Question: 19

Two coins are tos

Solution:

Total number times a coin is tossed = 1000

Number of times no heads occurred = 240

Number of times one head occurred = 450

Number of times two head occurred = 310

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

(i) Probability of getting at most one head is (that is Probability of no head and one head)

P(at most one head) = $\frac{\text{Number of times at most one head occurred}}{\text{Total number of times a coin is tossed}} = \frac{240+450}{1000} = \frac{690}{1000} = \frac{69}{100}$

(ii) Probability of getting at least one head is (that is Probability of one head and two head)

P(at least one head) = $\frac{\text{Number of times at least one head occurred}}{\text{Total number of times a coin is tossed}} = \frac{450+310}{1000} = \frac{760}{1000} = \frac{19}{25}$

Question: 20

A coin is tossed

Solution:

Total number times a coin is tossed = 80

Number of times head occurred = 35

Number of times tail occurred = 45

Probability P() = $\frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$

Probability of getting a head is P(head) = $\frac{\text{Number of heads occurred}}{\text{Total number of times a coin is tossed}} = \frac{35}{80} = \frac{7}{16}$

Probability of getting a tails is P(tail) = $\frac{\text{Number of tails occurred}}{\text{Total number of times a coin is tossed}} = \frac{45}{80} = \frac{9}{16}$

Here P(head) = $\frac{7}{16}$ and P(tail) = $\frac{9}{16}$

Now, P(head) + P(tail) = $\frac{7}{16} + \frac{9}{16} = \frac{16}{16} = 1$

Hence proved.